UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,499	07/18/2003	Philip Houghton	14934US01	3801

				EXAMINER
23446	7590	11/03/2004		BRINEY III, WALTER F

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ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/622,499	HOUGHTON, PHILIP
	Examiner	Art Unit	
	Walter F Briney III	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>18 July 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-22</u> is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-22</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>18 July 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1.   **Claims 1-3, 5-14, and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchok et al. (US Patent 6,522,746) and Foster et al. (US Patent 6,466,550) in view of Vijaykumar et al. (http://homepages.cae.wisc.edu/~mikko/552/ch5.ppt).**

Claim 1 is limited to *a combined sidetone and hybrid balance apparatus.* As a

first matter, it is submitted that this claim is directed toward an obvious combination of

two previously well-known prior art devices. The first device is a network echo

canceller, which is positioned between a circuit and packet-switched network. An

exemplary model will be discussed in connection with Marchok; in particular, figures 3

and 6. The second device is a sidetone generator for use at a customer terminal that

supports IP-telephony. An exemplary model will be discussed in connection with

Foster; in particular, figures 2, 8, and 9. The claim suggests a processor that can be

reconfigured to provide both of these functions in a mutually exclusive sense using a

switching configuration at the processor's input and output. While the switching

configuration will be addressed, it is noted that the courts have decided that *there can

be no invention in merely providing means to selectively alternate between one

unpatentable configuration of elements and another unpatentable configuration of old*

elements, where there is no new or different function. See The Duplan Corporation v. Deering Milliken, Inc., et al. 197 USPQ 342 (1977).

In regards to the claim limitations, Marchok discloses an echo canceller for use in a voice-over-IP network. See column 4, lines 1-50 and figure 3. The echo canceller is implemented as a high-level object-oriented computer program run on a programmable computer. See column 4, lines 7-17. The logical features of the echo canceller include the echo estimate filter (306) and the summation block (304). These correspond to the at least one filter and combiner, respectively.

Foster discloses a distributed conferencing system that includes customer terminal interface devices, which are depicted in figure 9. As an example, consider remote location (112). This device includes a PCM interface with a sidetone mixer (192) implemented as an audio feedback to the near-end. The device performs other operations necessary for connection with a packet network. While not explicitly depicted, it is inherent that the mixer include a weighting filter for near-end signal (160) and a combining circuit to mix the weighted near-end signal with the received signal. Foster also discloses that the remote location (112) is a typical desktop computer running VoIP software that implements the functions recited above. See column 5, lines 39-47.

Clearly, the same processor can be configured to perform the VoIP functions of both Foster and Marchok. The result of this configuration results in four logical switches that operate in the same manner as the claimed invention; analyzing a well-known

programmable processor's architecture and pseudo code implementing the echo

canceller and sidetone generator functions illustrates this point.

A programmable computer architecture is illustrated in the lecture notes

published by Vijaykumar et al. In particular, consider the multi-cycle datapath illustrated

on slide 41. This represents a typical RISC-processor supporting basic commands

such as load word, store word, add, and multiply. Thus, consider the following pseudo-

code for both the echo canceller and the sidetone generator:

```
Echo Canceller                          Sidetone Generator
R1 = Tx_in                              R1 = Tx_in
R2 = Rx_in                              R2 = Rx_in
R3 = Filter_1                           R3 = Filter_2
R4 = R1 * R3 ← convolution             R4 = R2 * R3
R5 = R2 – R4                            R5 = R1 + R4
Tx_out = R1                             Tx_out = R5
Rx_out = R5                             Rx_out = R2
```

Note: Tx_in, Rx_in, Tx_out, and Rx_out are symbolic names representing
memory in the I/O address space, and are used in interfacing the
processor to the network.

The presence of four logical switches becomes apparent by observing the source

operands for R4, R5, Tx_out, and Rx_out. Clearly, the echo canceller and sidetone

functions require access to the same input and output space, but use different registers

in their operation. The above pseudo-code is considered to be the minimum inherent

instructions needed to implement either the echo canceller or sidetone generator

functions.

It would have been obvious to one of ordinary skill in the art at the time of the

invention to adapt a single programmable computer for operation as either an echo

canceller or sidetone generator according to the above pseudo-code suggested by the

lecture notes of Vijaykumar. The proposed combination is obvious because the courts

have ruled that *there can be no invention in merely providing means to selectively*

alternate between one unpatentable configuration of elements and another

unpatentable configuration of old elements, where there is no new or different function.

Claim 2 is limited to *the combined sidetone and hybrid balance apparatus of*

claim 1, as covered by Marchok and Foster in view of Vijaykumar. Clearly, software

filters, as suggested by Marchok and Foster, are digital (i.e. *wherein the at least one*

filter is a digital filter). Therefore, Marchok and Foster in view of Vijaykumar makes

obvious all limitations of the claim.

Claim 3 is limited to *the combined sidetone and hybrid balance apparatus of*

claim 1, as covered by Marchok and Foster in view of Vijaykumar. As shown in the

rejection of claim 2, the filters disclosed by both Marchok and Foster are digital in

nature. However, that does not necessitate that they comprise a finite impulse

response. Therefore, Marchok and Foster in view of Vijaykumar makes obvious all

limitations of the claim with the exception *wherein the at least one filter is a finite*

element response (FIR).

The examiner takes Official Notice of the fact that implementing echo cancellers

and mixers using FIR filters was well-known at the time of the invention. It would have

been obvious to one of ordinary skill in the art at the time of the invention to implement

the filters of Marchok and Foster using an FIR filter because FIR filters provide the

stability and linear phase response necessary for echo cancellation and voice mixing.

Claim 5 is limited to *the combined sidetone and hybrid balance apparatus of claim 1*, as covered by Marchok and Foster in view of Vijaykumar. Clearly, adapting the programmable computer recited in the rejection of claim 1 inherently requires the use of different filter coefficients for mixing than for echo cancellation (i.e. *wherein the at least one filter uses a first predetermined set of filter coefficients in the first mode of operation, and a second predetermined set of filter coefficients in the second mode of operation*). Therefore, Marchok and Foster in view of Vijaykumar makes obvious all limitations of the claim.

Claim 6 is limited to *the combined sidetone and hybrid balance apparatus of claim 5*, as covered by Marchok and Foster in view of Vijaykumar. As stated above in the rejection of claim 5, the filter coefficients will differ for echo cancellation and mixing (i.e. *wherein the first predetermined set of filter coefficients and the second predetermined set of filter coefficients are different*). Therefore, Marchok and Foster in view of Vijaykumar makes obvious all limitations of the claim.

Claim 7 is limited to *the combined sidetone and hybrid balance apparatus of claim 1*, as covered by Marchok and Foster in view of Vijaykumar. As shown in figure 3 of Marchok, the echo estimate (306) is added to the near-end signal (102) in order to remove the echo from the near-end. This suggests that the echo estimate is the negative of the echo (i.e. *wherein the combining comprises one of at least adding the first input to the second input, adding the first input to the negative of the second input, and subtracting the second input from the first input*). Therefore, Marchok and Foster in view of Vijaykumar makes obvious all limitations of the claim.

Claim 8 is limited to *the combined sidetone and hybrid balance apparatus of claim 1*, as covered by Marchok and Foster in view of Vijaykumar. As discussed in the rejection of claim 1, a single programmable computer can be adapted to perform either the echo cancellation or the sidetone generation as claimed (i.e. *wherein the functionality is contained within a single integrated circuit device*). Therefore, Marchok and Foster in view of Vijaykumar makes obvious all limitations of the claim.

The apparatus claim 9 and the method of claim 20 are essentially the same as the apparatus of claim 1. In addition to the limitations covered by claim 1, claims 9 and 20 include *a mode input having at least a first state and a second state*. Referring back to the multi-cycle datapath depicted on slide 41 of the Vijaykumar, the operands used by the processor are selected by bits 25-21 and 20-16 of the instruction fetched from the memory. In accordance with the pseudo-code provided, different registers will be selected for the different mathematical operations performed by the echo canceller and sidetone generator. Therefore, Marchok and Foster in view of Vijaykumar makes obvious all limitations of the claims.

Claims 10 and 21 indicate that *the first and second signal paths comprise digital signals*. It is clear that both Marchok and Foster operate on digital signals since they are processed using programmable computers. Therefore, Marchok and Foster in view of Vijaykumar makes obvious all limitations of the claim.

Claims 11 and 22 are essentially the same as claim 8, and are rejected for the same reasons.

Claims 12-14 and 16-19 are essentially the same as claims 1-3 and 5-8,

respectively, and are rejected for the same reasons.

2.   **Claims 4 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marchok**

and Foster in view of Vijaykumar and further in view of Sih (US Patent 5,307,405).

Claim 4 is limited to *the combined sidetone and hybrid balance apparatus of*

claim 1, as covered by Marchok and Foster in view of Vijaykumar. As shown in the

rejection of claim 4, it would have been obvious at the time of the invention to use an

FIR implementation. However, the size of the filter has not been indicated. Therefore,

Marchok and Foster in view of Vijaykumar makes obvious all limitations of the claim with

the exception *wherein the at least one filter is a finite element response (FIR) filter with*

at least three taps.

Echo cancellers are typically designed such that they have enough filter taps to

account for the entire length of an echo signal. This is illustrated by Sih. In particular,

figures 10-12 illustrate that 512-samples are necessary to provide at least 64ms of echo

coverage. See column 21, lines 40-45. It would have been obvious to one of ordinary

skill in the art at the time of the invention to use at least three taps to provide echo

coverage, and preferably 512-taps for up to 64ms of coverage, as taught by Sih for the

purpose of enabling a network echo canceller to remove reflections from a remote

hybrid.

Claim 15 is essentially the same as claim 4, and is rejected for the same

reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F Briney III whose telephone number is 703-305-0347. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB
10/26/04

XU MEI
PRIMARY EXAMINER